

### **REMARKS - General**

By the above amendment, applicant has currently amended the specification, the abstract, and all of the claims to define the invention more particularly and distinctly so as to overcome the technical objections and rejections and define the invention patentably over the prior art references.

### **The Objection To The Specification Objections**

The abstract of the disclosure is objected to because the title in the abstract of the disclosure should be deleted as stated in the Office Action.

Applicant has currently amended the abstract and the specification of the disclosure. Accordingly, applicant submits that the abstract and specification complies with Examiner's requirements and therefore requests reconsideration and withdrawal of the objections.

### **The Rejections of Claims 16 and 17 on Molisch et al. (US patent application 2004/0198260) Under 35 USC 103(a) Are Overcome.**

The office action rejected the independent claim 16 and the dependent claim 17 over the patent application of Molisch, et al.

The independent claim 16 and the dependent claim 17 are currently amended.

The amended claims 16 and 17 are to emphasize the novelty of the invention and to define patentably over the prior-art reference thereof. Applicant requests reconsideration of these rejections, as now applicable to the amended independent claim 16 and the corresponding amended dependent claim 17 for the following reasons:

- (1) There is no justification in Molisch, et al. separate from applicant's disclosure, which suggests that the reference be a way in the manner proposed.
- (2) These novel physical features of the amended independent claim 16 produce new and unexpected results in such a way that proposed dual-mode transceiver for indoor and outdoor UWB communications completely operates in the different methods and deals with the different UWB signals in the

different situations that Molisch, et al. suggested, and therefore is novelty, unobvious and patentable over the prior-art reference.

### **The References And Differences Of The Present Invention Thereover**

Prior to discussing the claims and the above two points, applicant will first discuss the prior-art reference and the general novelty of the present invention and its unobviousness over the prior-art reference.

**Present Invention** - The present invention is a dual-mode transceiver for indoor and outdoor UWB communications along with novel architectures, especially designed for indoor and/or outdoor UWB operations. The present invention of the dual-mode transceiver has similar structure and operation functions for the indoor and outdoor UWB operation, but with new technology structures of different transmitter and receiver filters to meet different masks of FCC indoor and outdoor emission limitations. The dual-mode transceiver for the indoor and outdoor UWB communications, which is operated based on multiband (or multichannel) and multicarrier, can transmit and/or receive UWB signals by using one channel up to 11 channels in parallel within a frequency band from 3.1 GHz to 10.6 GHz. Each channel has a frequency bandwidth of 650 MHz. Furthermore, the dual-mode transceiver of the indoor and outdoor UWB communications employs orthogonal spread codes to all of the channels, thereby leading to all of the channels having orthogonal to each other. As a result, the dual-mode transceiver of the indoor and outdoor UWB communications can transmit and/or receive a chip data rate up to 7.150 Gcps with scalability. In addition, because of using a multichannel UWB solution, a low-speed A/D and D/A converters can be used. Therefore, the cost of such dual-mode transceiver can be made less expense.

**Molisch, et al.** disclosed a spreading waveform for a UWB communication system. The spreading waveform is shaped according to shaped data. Molisch mentioned indoor and outdoor operations having power spectral densities (see col. [0009]) and also

presented an equalizer (see 301 in Fig. 3) for compensating an amplitude fluctuation induced by a channel.

It can be seen that the indoor and outdoor power spectral densities that Molisch briefly mentioned are the FCC requirements of the emission limitations for indoor and outdoor UWB operations, which applicant already introduced them in the background section in detail. Molisch's equalizer (see 301 in Fig. 3) is eventually a spreading waveform, which is different from a spreading waveform in the transmitter to compensate for a channel distortion. The compensation is accomplished by an equalizer, which is configured as an amplifier. It is clear that the equalizer (see 301 in Fig. 3) is not a dual-mode digital receiver filter and is not even a digital receiver filter. Thus, Molisch's equalizer is completely different from applicant's dual-mode digital receiver filter architecture for the indoor and outdoor UWB operations. In addition, Molisch even did not mentioned whether the equalizer (see in Fig 3) is designed for indoor or outdoor UWB operation. Furthermore, Molisch's method is to operate an UWB communication system for a single wideband frequency from 3.1 GHz to 10.6 GHz, which is not a multiband approach. Thus, it is difficult for Molisch's method to support a scalability transmission data rate and a very-high data rate, which applicant's method does.

Further note that applicant's dual-mode digital receiver filter is integrated with novel UWB transmitter and receiver architectures that are especially designed for indoor and/or outdoor UWB applications. Applicant's dual-mode digital receiver filter uses multi-transition band filter masks that especially design for the indoor or outdoor UWB communications. Therefore, it is clear that applicant's dual-mode digital receiver filter for the indoor and/or outdoor UWB operation is completely different from what Molisch's equalizer does.

Moreover, note that Molisch et al. published the patent application on October 7, 2004, while applicant filed the present invention on July 10, 2003. Thus, it is clear that Molisch's invention will not be available for applicant. This is to say that it is impossible for applicant to see Molisch's patent application as a reference.

In summary, **Molisch, et al.**, is an art that presented the spreading waveform for the UWB communication system having the spreading waveform. Applicant's

invention is the dual-mode transceiver for the indoor and/or outdoor UWB communications. Applicant's invention is a single UWB communication device that enables to transmit a very-high data rate with scalability and programmability for the indoor and/or outdoor UWB operation. Therefore, application's invention using the dual-mode transceiver for the indoor and/or outdoor UWB communications is fundamentally different from Molisch's method thereof. As a result, it is impossible and unobvious to one having ordinary skill in the art to develop the dual-mode transceiver for the indoor and/or outdoor UWB communications even given Molisch's prior-art reference.

**Molisch, et al. Does Not Contain Any Justification To Support Individual Way, Much Less In The Manner Proposed**

With regard to Molisch's invention, it has been shown that there are fundamentally differences between applicant's invention and Molisch's invention as applicant discussed above. Therefore, it is invalid to use the prior-art reference to reject applicant's invention under 35 U.S.C. 103(a). Thus, applicant submits the fact that the dual-mode transceiver for the indoor and outdoor UWB communications produces advantages militates in favor of applicant because it proves that applicant's invention produces new and unexpected results and hence is unobvious.

Therefore, applicant submits that Molisch's invention form is not legally justified and is therefore improper. Thereby, applicant submits that the rejection on the prior-art reference is also improper and should be withdrawn.

**The Novel Physical Features Of the Amended Independent Claim 16 Produces New And Unexpected Results And Hence is Unobvious And Patentable Over The Reference Under 35 USC 103(a).**

The applicant also submits that the novel physical features of the amended independent claim 16 is unobvious and hence patentable under 35 USC 103(a) since it produces new and unexpected results over Molisch's invention thereof.

These new and unexpected results are the ability of applicant's invention of the dual-mode transceiver for the indoor and outdoor UWB communications not only to

transmit UWB signals at a very-high data rate but also to provide the data rate scalability and programmability for the indoor and/or outdoor operations, thereby meeting both requirements of the FCC emission limitations.

Therefore, applicant's invention of the dual-mode transceiver for the indoor and/or outdoor UWB communications is a novel and vastly superior to that of Molisch's invention thereof. The novel physical features of applicant's invention of the dual-mode transceiver for the indoor and/or outdoor UWB communications that affects these differences are, as stated, clearly recited in the amended independent claim 16.

#### **The Amended Dependent Claim Is A *Fortiori* Patentable Over Molisch**

The amended dependent claim 17 incorporates all the subject matter of the amended independent claim 16 and adds an additional subject matter that makes it a *fortiori* and independently patentable over the prior-art reference. Accordingly, the applicant submits that the amended dependent claim 17 is a *fortiori* patentable and should also be allowed.

#### **Conclusion**

For all the reasons given above, applicant respectfully submits that the abstract, specification, and claims are new in proper form, and that the claims all define patentable over the prior-art reference. Therefore, applicant submits that this application is now in full condition for allowance, which action applicant respectfully solicits.

#### **Conditional Request For Constructive Assistance**

Applicant has amended the abstract, specification and all of the claims of the patent application so that they are proper, definite, and define novel physical feature structures, which are also unobvious. Therefore, this application is submitted that patentable subject matter is clearly present. If, for any reason this application is not believed to be in full condition for allowance, applicant respectfully requests the constructive assistance and suggestions of Examiner pursuant to M.P.E.P. Section

2173.02 and Section 707.07(j) in order that the undersigned can place this application in allowable condition as soon as possible and without the need for further proceedings.

Very respectfully,



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Date: January 14, 2006

Inventor's Signature:

